

COST AND MANAGEMENT

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**A New Look
at Production Planning . . .**

By J. N. Reynolds, Jr.

LOSS

*Official Journal of
The Society of Industrial and
Cost Accountants of Canada*

NOVEMBER, 1957

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- aiding administrators in solving specific management problems,
- devising and giving effect to better management methods, and
- providing such other advice and help as may enable busy executives to get quicker and better results than would otherwise be possible.

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HUMANITIES OF CONTROLLERSHIP

By W. M. V. ASH 386

The President of Shell Oil Company of Canada, Limited, Mr. Ash began his career with Shell after graduating from Oxford in 1929. His extensive and varied experience in the oil industry was gained in the Near East, the U.S. Pacific Coast, New York, Western Canada and Trinidad. He was appointed to his present position in 1948.

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Trained as an engineer in England in the City and Guilds of London Institute, of which he is an Associate, Mr. Hills is now President of Urwick, Currie, Ltd. He became a management consultant with the firm in 1934, left in 1945, and returned eight years later as Senior Partner in charge of Canadian activities.

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Mr. Reynolds, who has been in the management consulting field for 15 years, is a senior staff member of Scovell, Wellington & Company, serving as a Consulting Systems Engineer. He attended the University of Massachusetts, Northeastern University and American International College, majoring in economics and accounting.

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Dr. Lazer is Assistant Professor of Marketing at Michigan State University and has also taught at the University of Manitoba. He has had considerable consulting experience and has been a frequent contributor to business journals.

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The author is Industrial Relations Manager, Computing Devices of Canada Limited. He is a graduate of McGill and Cambridge. A holder of the Coronation Medal, he directed technical projects for Britain during the war and later served with the Defence Research Board, Ottawa.

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Editorial Comment . . .

A GROWING PUBLICATION

When the first issue of *Cost and Management* appeared in September 1926, it bore little resemblance to the compact journal of the present. It did, however, have one thing in common with today's journal; a broad scope and a lively interest in accounting and managerial developments over and beyond the local scene.

In the foreword to the first issue, the Board of the Canadian Society declared its intention to "reprint selected articles from many publications", in addition to the original articles that were the mainstay of *Cost and Management*. Among those to whom the Society acknowledged its indebtedness for articles were the Institute of Cost and Works Accountants, the Institute of Administration and the Industrial Institute of London, England and the Society of Industrial Engineers, Chicago.

Thirty-one years later the Society has been able to reciprocate the favour in kind. Though it no longer carries reprints, *Cost and Management* has developed an international appeal of its own and articles and editorials from its pages are regularly reprinted and often cited in business publications at home and abroad. Of recent example, the article "The Economics of Management" by Calvin C. Potter from the June 1957 issue is scheduled to appear shortly in translation in the Italian review *Mercurio*. Since January of this year, five articles from *Cost and Management* have been digested in English publications; three in *Management Abstracts* and two in *Costing*. Two have appeared in American publications; the *Accountants Digest* and the *Management Guide*. Four have been reprinted in *The Irish Accountant*.

Closer to home, C. B. Taylor's "The Industry-Wide Approach to Financial and Operating Ratios", published in the May 1956 issue, was reprinted in four different continental North American publications.

In addition, favorable reviews of *Cost and Management* articles have been carried in the American Management Association's *Management Review*, the *Canadian Chartered Accountant*, the *Journal of Accountancy*, *N.A.C.A. Bulletin*, and many others.

An article by Ralph W. Porter in the September 19th issue of *The Christian Science Monitor*, reviewing the Harvard University Graduate School of Business Administration's monthly guide to reading for executives, notes that the August issue of that publication lists "Cost Control is People" by Robert I. Dickey from the May 1957 issue of *Cost and Management* as tops in periodical reading for the aspiring executive. Mr. Porter's summary of the case for post-graduate reading is worth quoting:

EDITORIAL COMMENT

"Books continue to be trustworthy paths to knowledge as the boy progresses through school and college. They continually open the gates to literature, history, the sciences, or any other subject that may interest him.

But when his formal education is completed this young man is quite likely to cast aside the tools that have helped him through the years and plunge into the business world prepared to seize the laurel crown of success with bare hands. His reading may be limited to the daily paper, a couple of magazines, westerns or 'who-done-its'.

What was the accepted practice in father's youth is outmoded today. The man who shuns educational opportunities offered by trade and business literature soon finds himself at a disadvantage in competing with others who keep abreast of the times. Promotions more often than not come to those whose extracurricular activities include courses in night school and through perusal of trade pamphlets and books on industry and management."

The link between education and international good will may seem to be a tenuous one to many minds. They may argue that technological development, capped by such revolutionary achievements as "Sputnik", is the chief dividing issue and bone of contention in the world today. They are, so to speak, adherents of the cyclical view of history who argue that the world, for all its pretensions to advancement, makes no real and lasting progress in human happiness.

On the other hand, we have those who argue that the world, in spite of temporary set-backs, is steadily advancing to a Utopian destination. Looking back into history, we are inclined to support the latter view. From the city states of Greece, through the Alexandrian, Chinese and Roman Empires, to the modern democratic and socialist states, there has been not only a broadening of unity but a broadening of concepts. Each era has introduced some new pivotal idea which, imperfect or even distorted as it may have been in practice, remains as the nucleus for an eventual and attainable synthesis of ideas. Each political, technological, or social idea has comprehended some part, not all, of the truth. An interchange of ideas, education in short, is the obvious instrument for reblending all parts of the truth and promoting international harmony.

Needless to say, we are pleased and proud that *Cost and Management* has been able to contribute in some small way to the growing pool of international knowledge and experience. Now that burgeoning populations and revolutionized communications have forced the nations into close quarters, they must learn to live in harmony and share the knowledge that alone is power. We are well on the way to H. G. Wells's prediction for a future world, "Men will unify, only to intensify the search for knowledge and power and live as ever for new occasions." If, in any measure, we have been able through our periodical to further education, the key to world betterment, then we are well content.

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C. & M. Round-Up . . .

By N. R. BARFOOT, R.I.A.

LOOKING AHEAD

More and more liquids are being sprayed. The range of Aerosol sprays is widening. Pressurized tins are being used to market drugs, perfumes, paints, varnish and even foods.



New Canadian Encyclopedia will soon be on sale. It will consist of ten volumes, 5,000 illustrations, 3,000 biographies and thousands of special articles. More than 800 scholars have contributed. First volume off the press this month.



New Entertainment gimmick is in the research stage . . . copies of motion pictures on throw-away paper to sell at \$2.00 each.



Gold Dust may now be bought in a package for adding to paint. It will give a gold flecked appearance. Made in U.S.A.



1958 Cars require 100 octane gas. The new '58 cars with compression ratios of $10\frac{1}{2}$ to 1 require 100-102 octane gas compared to many of the present premium (98) octane gases. The thing to do is to try the various grades of gas and use the one on which your engine operates without ping or knock. To get maximum mileage, stay within the 50 mph range and avoid fast starts.



Nuclear power will come in small packages. The submarine Nautilus travelled 60,000 miles on a charge of uranium about the size of a golf ball. This is the equivalent of 720,000 gallons of oil or 90 tank cars.



OF GENERAL INTEREST

The natural gas era has arrived in Canada.

Exploration and development are in the past and we are now in the construction period.

More than 750 million in construction and operation is planned for the near future by two major transmission companies and a dozen distributors.

Trans-Canada's 34" line has reached Winnipeg and has now reached the Ontario border.

Companies in B.C. are well ahead of schedule both in the cities and the inland.

Some six companies are laying lines in Ontario from the head of the lake to Montreal with feeders in every major centre of Southern Ontario.

Gas will be used for heating in thousands of homes and industries in Canada for the first time in September through to year end.



Canada's first prototype atomic power plant is now almost completely designed.

Target date for operation is 1960-61.

COST AND MANAGEMENT

Power output 200,000 K.W.

It is the only one of its kind, will use heavy water as a moderator and uranium as fuel.

It will provide the technical and operational know-how for commercial power reactors.

Commercial nuclear power should be available and commercially competitive with coal and hydro plants by 1965.



U.S. Capital in Canada now stands at eight billion . . . one-half billion more than at '56 end. 63% of this investment is in firms controlled from the U.S. 82% of all foreign controlled business in Canada is U.S.



Drop in Productivity

Productivity, or the output per man, is dropping and has been since the fourth quarter of 1956. There are several possible reasons. Individual output per man may be dropping. Employers may be keeping more men on the job than is justified by the volume of business. Productivity is the key to progress and higher standard of living. It is essential in a society such as ours to keep productivity continually improving.



The next decade will see a substantial increase in capital investment during the next ten years, says a recent survey. Here are the pertinent facts and figures.

Over 10.5 billion will be spent on expansion.

Biggest single projected spending is two billion by petroleum industry. Iron and steel follow with 1.67 billion, paper products 1.27 billion, non-ferrous metal products almost a billion and chemical product industries 877 million. The other industrial groups follow in varying smaller amounts.

Projected spendings by geographical divisions are as follows:

Ontario	4.73 billion
Quebec	2.76 "
B.C.	1.37 "
Prairies	1.11 "
Maritimes	.65 "

More than 50% of the expansion has not yet reached the planning stage.

Employment will be considerably higher with iron and steel, electrical and transportation industries creating the most new jobs.

Decentralization of many industries is planned and many concerns will establish branches in Western Canada and the Maritimes for competitive reasons.



ON THE PERSONAL SIDE

To clean venetian blinds a new vacuum sweeper attachment is offered for sale. It is a twin duster arrangement selling for \$4.00.



A four-year clock made in Germany is powered by batteries and claims great accuracy and power supply does not fluctuate. It is insulated against temperature changes.

C. & M. ROUND-UP

Inflatable chaise lounge manufactured in Germany is soon to appear on the Canadian market. Measures 75" x 24½" when blown up. Deflated it fits into a 27½" x 24½" carrying case.

—o—o—

Every hour, 48 new Canadians arrive in one way or another. The population increase is approximately 36,000 per month.

—o—o—

Fishing may be easier for you if the new electronic fish finder is put to use. It indicates size, number and location of fish without disturbing them. Unit weighs 26 lbs. and operates from batteries.

—o—o—

New Power mower can be used to grade and seed lawns, sweep leaves and clean snow. A special but single transmission permits the machine to pull loads up to 1,000 lbs.

PERSONALS

Charles J. Helmes, R.I.A., has joined Mead Johnson of Canada Ltd., Belleville, Ontario, as Manager of General Accounting. Mr. Helmes was formerly with The Quaker Oats Co. of Canada Ltd. in Peterborough.

Paul Cormier has been appointed Accountant and Office Manager of Mead Johnson du Quebec Ltée.

Rev. Brother Irenée, R.I.A., C.A., a member of the Quebec Educational Committee, recently celebrated his 50th anniversary in his religious order and 30th anniversary as teacher of accounting. The occasion was commemorated by a presentation from the Quebec Chapter.

Marc Lehoux, M.Sc.C., C.L.U., First Vice-Chairman of the Quebec Chapter, was a featured speaker on the subject "Life Insurance and the Young Men of Today" at the recent Educational Congress of the Chartered Life Underwriters in Quebec City. Mr. LeHoux also made an extended tour of Quebec for the C.L.U., addressing young insurance agents in training.

T. W. Adair, R.I.A., formerly Assistant Manager and Chief Accountant of The Ottawa Credit Exchange Ltd., has been appointed Comptroller of Rothwell-Perrin Lumber Co. Ltd., Portland, Ontario.

Books in Review . . .

By **GEORGE MOLLER, D. Juris, C.A., R.I.A.**

MANAGEMENT ACCOUNTING FOR PROFIT CONTROL

By **I. WAYNE KELLER, D.C.S., C.P.A.,**
Controller, Armstrong Cork Company.

McGraw-Hill Book Company Inc., 1957 — \$8.40 — 425 pages and Index.

The crop of management accounting text books is still a small one, although writings on management accounting appear as fast as mushrooms after a summer rain. This book has several rather unique features which recommend it to the management accounting trainee and the executive in practice. First of all, it has been written by a controller who has gained prominence in developing the measuring stick of return on capital employed in industry, and who has lectured and written on this subject widely. In the preface, the author emphasizes that his book is intended to show how accounting principles, cost accounting and budgeting are inter-related units of an integrated system serving management in its planning and control function.

Although the approach, as could be expected, is the one from return on capital employed, Mr. Keller has succeeded in presenting a rather complete picture of the organization for management accounting, starting with cost accounting, based on the chart of accounts, reviewing procedure for actual and standard costs, direct costing, joint and by-products and dealing with distribution expense, administrative expense and income accounting.

The second part of the book is devoted to budgets, particularly sales budgets, factory cost budgets and the operating budget, all this leading systematically to Chapter 24 on "Measurement and Control of Profits." As expressed in the preface, "the objective of management in an economy of free competitive enterprise should be to earn maximum profit consistent with the long-range stability and growth of the company in the current economic and social conditions of the nation." This objective is usually called Profit Optimization, a branch of scientific management which becomes more and more emphasized.

Heretofore, the management accountant who wanted to use the yardstick of return on investment and capital employed had to search through numerous articles for a description of the method and its practical application in industry and business. Mr. Keller's book contains a concise but lucid explanation, not only of the basic formula, but also of its application to the capital expenditures budget, including a description of the appropriation requests based on recovery period and return on capital employed.

The concluding chapters are devoted to reporting to top management, make or buy and lease or buy decisions, break-even analysis, leading to the final chapters on setting sales prices and intra-company trading prices, both extremely important facets, particularly in decentralized management organizations.

BOOKS IN REVIEW

The book is written with an eye on the student's needs which is documented by review questions and problems at the end of each chapter and the presentation of a summary problem at the end of the book.

It would be very tempting for the reviewer to go into details, particularly in connection with the allocation of cash or the determination of the recovery period and other intriguing phases in the application of the return on capital employed, but this discussion would, by necessity, be too limited to convey to the reader a clearer picture of the value of this work. The management accountant who reads the book will doubtlessly find numerous practical solutions to problems which beset us in our daily practice.

TAX FORM DISTRIBUTION METHOD CHANGED

The Taxation Division of the Department of National Revenue advises that certain changes will be made this year in the method of distributing forms T4 Supplementary to individual accountants and accounting firms. Last year, employers were asked to advise the name of their accountant and the supplementary forms were shipped to the accountant. However, there was no identification on the shipment to the accountant so the accountant did not know for which of his clients that particular supply was intended, and it is believed that a great deal of confusion and duplication of supplies resulted.

This year, the employer will be informed on the notice received from the Taxation Division not to complete the related portion of the requisition card if an arrangement has been made for an outside accountant to prepare his T4 report. Thus the Department is leaving it to the individual accountant and accounting firms to procure their own requirements of T4 Supplementary forms by writing or calling the District Directors—Taxation. However, should the T4 fail to be filed on time owing to a misunderstanding between the employer and the outside accountant, the general instruction on the requisition form will not be accepted as a valid reason for not imposing the late filing penalty upon the employer or for imposing it upon the accountant instead of the employer.

The Department also advises that form T4 Supplementary will be available this year in both unit sets and continuous form. The form has been increased in size from a slip $8\frac{1}{2}'' \times 1\frac{1}{2}''$ to a slip $8'' \times 3''$, in the case of the unit sets, and $8\frac{1}{2}'' \times 3''$, in the case of the continuous. The continuous form has the feature of parts 1 and 2 being glued together in a left hand side stub whereby, after removing the carbon, these two parts can be broken into individual controlled duplicate sets for distribution purposes.

Supply of the 1957 T4 forms will be available in December of this year at the District Taxation Offices and it is expected that supplies of the 1957 Income Tax forms T1 Short and T1 General will be available upon request at any Post Office or District Taxation Office on and after 2nd January, 1958. Form T1 Short will again be printed in sets, each comprising two copies of Form T1 Short and one copy of the Employee's Income Tax Guide.

Humanities of Controllership* . . .

By W. M. V. ASH,

President,
Shell Oil Company of Canada, Limited,
Toronto, Ontario.

A controller must be an extra set of eyes and ears for top management, the author believes. As such, he must have all the attributes of the successful manager. Above all, he must be human if he is to gain the respect of his men.

WHAT makes a good controller is a theme for various interpretation. If a Scot for instance were writing a text book on the subject he might entitle it: "The Controller and the Expense Account". The Frenchman might take the subject: "The Love Life of the Controller". The Englishman would choose: "Controllers I Have Hunted".

Possibly some of these approaches would be more interesting than mine. The theme I want to develop is that the controller must be a manager in the broadest sense of the word—a man and a manager if you like to put it that way. John Stuart Mill said "Men are men before they are lawyers or physicians; and if you make them capable and sensible men they will make themselves capable and sensible lawyers or physicians." He might well have added controllers to the other professions.

A Man and a Manager

So my first and most important point is that the best controller is a man and a manager first. Remember that because I will come back to it—a *man* and a *manager*. Borrowing from Professor Bladen at the University of Toronto in another context—"he is a mature individual who has developed not only his intellectual capacity but also his imagination and his sense of value rather than an individual who happens to have acquired a professional degree and who may or may not have acquired in the process a full education."

What is a manager? A famous general once said the job of a commander could be described as planning, making decisions, assigning responsibility and supervising. He went on to say that a general must know his officers' characteristics—who must be slowed down, who must be urged forward, who can be trusted on his own and who must be watched.

That's also a pretty good description of a manager. A text book on management—Newman's "Administrative Action"—puts it like this, and it's really the same thing the general said but in different words. Newman says a manager:

- Plans
- Organizes
- Motivates
- Co-ordinates
- Controls

*An address to The Controllers Institute of America at Toronto on October 8, 1957.

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The Eyes and Ears of Management

The controller will do all of these things within his own field. Top management in its field is performing the same functions. The controller is an extra set of eyes and ears for top management. Traditionally emphasis is placed on his role in the last of the above-named functions—that of *controls* in the sense of checks or restraints. More emphasis should be placed in a broader field. Let me tell you a story to illustrate it. Twice a year I lead a discussion group for half a day in a management course at Arden House attached to Columbia University. I've accused the boys of sitting up nights thinking up embarrassing questions for the lecturer. One was—"Mr. Ash, you are a president, what is the most difficult job you have to do?" The best I could do to field that one was—"I don't know what is the most *difficult* thing but I know what takes up the most *time*—people."

The question took me by surprise and I gave the immediate answer that came to mind. On reflection I would still make the same answer. A tremendous lot of a chief executive's time is spent on matters such as appointments, promotions, labour relations and other questions having to do with people. However a very close rival to the personnel officer in taking the time of the president is undoubtedly the controller.

The Controller—Historian and Planner

His most obvious line of course is that of *history*—the overall financial results, cost figures, sales figures, budget control, even expense accounts! Less obvious is the line of the future, but more and more are we seeing the controller as the co-ordinator and spearhead of what we call our Planning Group. He is responsible for getting from the sales people their projections of our forward marketing picture, collating these with our refining and transportation plans and looking at the whole through the magnifying glass of our income, costs, cash flow and other financial data. It is his responsibility to see these several figures are regularly assembled and presented to the Planning Group over which the president presides.

A word about our philosophy of planning. Our planning is done on what the experts call a revolving system—really three plans in one. First we have a ten year forward estimate, drawn with broad strokes, which gives us some idea of the timing of our major moves, particularly in financial terms and in what I might call—*emphasis*. For instance in this ten year forecast we may see with some approximation where will fall a major move into a certain field of chemistry—a matter of *emphasis* versus other activities. We hope at least to see the *order of magnitude* of the problems to be expected over the ten year period.

Then we have a three year estimate which is really looking through the ten year telescope with a three times finer lens. This is still not a budget but is just preparatory to it. Based on our three year forecast for

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instance we may buy land for a chemical plant or a refinery this year which we may not build till 1960.

Finally we have our annual budget of the capital programme for the ensuing year. This is the distillation of the ten and three year forecasts—a one year plan of what we can do and are justified in doing *now*. The essence of all is they're revised every year. Each year a new budget for the following year is made, the three year forecast is revised, a year is added—and the same for the ten year forecast. Hence the expression—"a revolving plan".

In *all* of this the role of the controller is a key one. You can imagine therefore such a man is most certainly a real manager in the sense of my opening remarks. He must be familiar with all sides of the business, he must get along with people, and he must have a strong analytical faculty in presenting the facts and figures which he collects. Here we are talking in terms not of bookkeeping in the classical sense but of "meaningful figures" or better still "meaningful reports".

Attributes of a Good Controller

So when I said the controller is an extra set of eyes and ears for top management, you will agree that very special eyes and ears are needed, at least very acute ones.

Certainly he is called upon to deliver something over and beyond the normal line of professional aptitude as an accountant. He must have first-class training. But he must have *more*. He must have a fair share of certain rather intangible aptitudes if he is to become a *real manager* in the sense developed at the beginning of this article. Let me elaborate.

In some countries inheritance counts for more than achievement. In America not so. In our North American way of life the leading man in his community is the leader in business. Quoting Professor Bladen again: "Business men have become the new aristocracy and they must learn that nobless oblige." And I think I know how the Professor would answer the question—what brings them there? What makes the successful business man? Certainly not academic distinction alone. We all know men who reached the top of their class at school but of whom, sad to relate, it can be said of their career in later life: "Too many brains and not enough ability." Personality, thoroughness, drive—often that priceless possession a strong constitution—are among the things that make the successful individual. But there is one common thread and that is character.

Dean David of the Harvard Graduate School of Business Administration puts it this way: "In my observation, those business men who have been most effective in public affairs—those who, in a word, have been true business leaders in this complex world—all share certain

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attitudes and characteristics in addition to competence. First and foremost, these men exhibit what I like to call 'tough-minded humility'. The tough-mindedness is essential to competent handling of complex problems and flows from that training and experience in calculated risk-taking and decisive judgment which I have stressed. But the humility is of equal importance. It flows from a recognition of the complexities of the problems and the fact that many diverse backgrounds and talents must be brought to bear upon their solution. I am convinced that the public over a period of time does not respond to an intolerant, dogmatic, imperious, or cocky leadership in politics, in labour, or in business."

Call it character or call it leadership. The president of a large American industrial concern put it to me as the quality which will cause men to follow a leader even if he is wrong.

Humanities of Controllorship

Any executive knows that his men talk about him. Their families ask about him. A father, retired perhaps, will ask his son (even if he never puts it into so many words) the fundamental question—is his *self-respect* increased by his manager's treatment? A wife might ask her husband, "Does the manager respect your rights as a person? Always? Usually? Sometimes? Never? Does your manager make you feel important to the job? Does he recognize good work? Does he bawl you out in front of others or does he talk over your shortcomings in private?"

Some might think this is a "soft" approach. I don't think it is a soft approach at all. No manager should ever *seek* popularity—but he should always aim at gaining the *respect* of his men.

I believe that favourable answers to these questions will show the real manager. One who will have the *respect* of his men—more important than popularity in the sense that some men seek it. In other words to quote my general again, it's better that the men refer to their boss as "that so-and-so" than as "that stupid so-and-so!"

Before we leave this matter of the humanities, may I make an appeal to managers on behalf of the son whose father asked that imaginary question earlier. Encourage youth! Treat him as you hope your son's manager will treat *him* when *he* starts work.

I want to tell you a story about a boy who nearly didn't get that kind of understanding.

This was told me by Professor Dodge, Professor of Geology at the University of Southern California. Some years ago a university student obtained summer work on a field party of the United States Geological Survey. His party was one of two running a line in unsurveyed territory. They worked the line from both ends towards the middle. In due course the two parties were to meet and join up their lines. When

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the two parties did meet it was found their lines diverged, and the university student was immediately blamed for the error by *his* party chief. The other suggested that instead of firing the boy they should first go back over the separate lines and find out where the error occurred. This check revealed the mistake was not the boy's but was in the other party. So he wasn't fired and he went on to become a great geologist. His name is Gene Holman and he is Chairman of the Standard Oil Company of New Jersey.

Conclusion

To pull everything together, I might conclude with the following summary.

In the first place the true manager in the controllership field must be professionally first-class. By this I mean more than simply the technical qualification that gives him the right to place certain letters after his name. Stephen Leacock many years ago addressing a meeting of business men in Montreal said: "Education is a peculiar process. You aim at one thing and you hit another. You set out to look for ultimate truth and you don't find it but incidentally you have acquired a cultivated mind. You pursue studies that you think will be of use in your business. They are not. But by the time you are done with them you yourself are a better man for your business or for any other business."

I think if Stephen Leacock were looking for a controller he would agree that over and above the normal line of professional ability, he must have a critical and an analytical faculty, a capacity for taking pains, a gift for the presentation of what I have called "meaningful figures and reports", a "divine discontent" and a talent for seeing ahead—an extra set of eyes and ears for top management.

He should have another talent—the capacity to pick the right men. This is almost the most important talent he must have. Not quite—the most important comes last. But if he can pick good men he's a long way on the road to being a real manager. A jocular definition of an executive is—"A hook an' eye man." A man who is always saying—"Who can I get to do this, who can I get to do that!" But like most quips of this sort, it has a serious note. We all can think of men who apparently had all the talents but were ruined by a weakness for picking the wrong associates.

Napoleon said he would rather have a lucky general than a clever one. Would you rather have a magna cum laude at his college or a judge of human nature? The capacity to pick men is important indeed. It brings us to the last aspect of that controller for whom we are hunting. The *real* manager—is he human?

We have seen three sides of him. The fourth is one without which he will never attain that indefinable "character-in-the-large" which is

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the essence of the true manager. I called this earlier the humanities of his makeup. Here is a closing list of his essentials. Check yourself against it.

People are the most important—men before manuals.

Executive means you.

The function of an executive is to plan, make decisions, assign responsibilities, supervise.

Do these things and the respect of your people will follow.

Encourage youth.

Praise before others—criticize in private.

Talk over performance.

Face and deal with incompetence.

Delegate does not mean abdicate. It means: Set high standards—for yourself first.

Give responsibility.

Exact accountability.

It's a tall order. Borrowing from Kipling—if you can do these things:

"Yours is the earth and everything that's in it
And—which is more—you'll be a man, my son."

A man and a manager

FOR FURTHER READING

RESEARCH FOR MODERN CONTROLLERSHIP, by J. McCall Hughes, The Controller, Sept. 1956.

WHAT IS A CONTROLLER? by E. B. Cochran, The Journal of Accountancy, July 1955.

THE CONTROLLERS' FUNCTION IN TOP-LEVEL MANAGEMENT, by G. A. Walsh, The Journal of Accountancy, July 1954.

PAYNE, PATTON & PUGSLEY

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Organizing for Financial Control* . . .

By BRUCE A. C. HILLS,
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Control is an essential part of administration if management is to ensure the proper carrying out of its short and long range plans. Good control requires careful and wise organization, the principles of which are outlined in the following article.

MY SUBJECT, in spite of a somewhat ambiguous title, is not how to organize proxies and stock-snatching in order to obtain financial control of, say, the Atcheson, Topeka & Santa Fe Railroad, but deals with the method by which control can be applied to a company's operations so as to obtain a correct and overall picture of the financial health of that company.

Now before you can determine the best method of doing anything, you want to be quite sure about the end result to be achieved. So let us start with that. We have to answer the question "financial control for what purpose?" It is not, for example, for the purpose of preventing Joe Doe from running off with the petty cash. Coming nearer home, it is not solely for the purpose of ensuring a certain profit—although that is part of the story. What, then, is the purpose?

Elements of Administration

To find the answer we must consider the part played by control in the overall job of management. It is in fact part of the mechanics of administration. The function of administration can be broken down into six elements as follows:

FORECASTING—You take steps to find out what can be sold and made and what your costs are likely to be;

PLANNING—On the basis of your forecast you make your plans for a certain period ahead;

ORGANIZING—You check your organization structure and its facilities to make sure they are appropriate and adequate;

DIRECTING—You issue your plans to all concerned and thereby direct their joint efforts into the right channels;

CO-ORDINATING—Through your organization structure you co-ordinate their efforts so that all are working together for a common purpose, towards a common objective; and finally

CONTROLLING—You make sure that the plans for output, performance and costs are followed effectively, that there is no serious deviation, by using the mechanics of control—financial statements, budgetary control, material and labour controls, output and sales reports, and so on.

*An address to the Toronto Chapter of the Society of Industrial and Cost Accountants on October 10, 1957.

ORGANIZING FOR FINANCIAL CONTROL

Function of Control

Now we can see where the function of control fits into the picture of administration. We can see its purpose and its importance. It is to ensure that the enterprise is running on the course set for it. Because you can make your plans, you can issue the appropriate directives, you can order men and machinery so that the plans can be achieved, but all this work will have been in vain unless you take steps to check whether the plans *are* being followed. That is the function of control. It means knowing what is to be done, checking that it has in fact been done. While every element of administration is a very necessary one, that of control can be said to be vital to the successful running of any enterprise. It is as essential as the use of charts, soundings and "fixes" in piloting a ship—and it has the same purpose, to reach the next port as quickly and economically as possible without running on the rocks. Its basic principle is simple; before you undertake any project you must fix the potential income in the way of sales; determine all the associated costs of completing the project in its planned form; make sure that the difference between potential income and planned expenditure provides for a large enough margin for capital needs. Having done all this you then examine periodically the actual income, the actual expenditure and the actual margin in comparison with the planned or budgeted figures for each. Now isn't this just what the wise family man does for his own expenditure? He figures his income; he budgets for rent, housekeeping, clothes and all running expenses; he checks the balance to make sure it will cover necessary capital expenditure relative to automobile, furniture, etc. and sundry interest or other annual payments. Then, if he is sensible, he checks each week or month that the actual figures are in line with budget. If he spends too much on housekeeping and clothes he will be short on his auto or refrigerator payments; if a company spends too much on production costs, or fails to receive the expected income, it will be unable to make essential capital expenditures or be forced to start borrowing—both will harm its future. Now the important point is this; without the continuous watching, without the constant mechanics of control showing up excess costs, too low income and other danger signals, the adverse position is not known until it is too late to correct it. Of course, there is a major difference between the family man with a relatively fixed income and the company dependent on the achievement of a pre-determined level of sales, but the principle still holds good. My father used to quote an old tag frequently—"Income 20 shillings, spending 19 shillings, spells safety; income 20 shillings, spending 21 shillings, spells bankruptcy." Control means spotting that 21 shillings expenditure and taking steps to correct it before it is too late.

Basis for Control Accounting

There are certain other points we must take into consideration before we can organize for financial control. First, let us deal with

COST AND MANAGEMENT

that question of profit. A profit and loss account and a balance sheet do not in themselves give the financial control we seek according to the definition we have established. The profit margin shown in any profit and loss account is not only a relatively arbitrary thing, depending very much on the point at which you strike it, but also it is historical and relative to one short period in the planned progress of the enterprise. It therefore fails to show the whole picture. That word profit has caused more troubles in industry than any other simple word. It has become to be associated with a preciseness, a "definitiveness", which it can never achieve; in the minds of the workers and the labour unions it has come to mean an actual amount of free and unencumbered cash, which can be handed out like so much candy to school kids; in the minds of management too often it connotes a condition in the affairs of the enterprise which is contrary to the actual. I wish it were possible to strike it from our vocabulary. Profit is generally conceded to be the difference between the total income in sales and other sources on the one hand, and the total related revenue expenditure for the same period on the other. Just what you take into sales and revenue expenditure is often a matter of individual opinion or choice. And the careful calculations of profit and loss are often made worthless by arbitrary assessments of the value of inventory or inappropriate allowances for depreciation.

For effective control purposes I suggest it is much better to think in terms of total income and total expenditure matched against the amounts planned for these. You will, of course, have to break down each category so as to associate items of expenditure and income with those managers who can affect their extent. You will also have to provide a form of profit and loss account at different stages for managerial incentive purposes. But the general basis for control accounting should, I submit, be this:—

The total income from all sources to be derived from as long a period of operating as is possible to forecast and expressed as progressive annual rates must be such as to provide for the resulting total expenditure again expressed as progressive annual rates including (a) all labour, material and other expenditures of a revenue nature at the plant level, (b) all selling, administrative and similar expenditure necessary to complete the job of distribution, (c) appropriate expenditure on research and development, (d) necessary tax expenditure, (e) dividends and other forms of interest on all monies borrowed as capital, (f) expenditure on plant, machinery and buildings and similar expenditures of a capital nature necessary to replace existing facilities and to provide for expansion of these as required. Therefore, it is necessary both to plan for all these expenditures and income over an appropriate period and to exercise control by measuring actual performance against these plans.

ORGANIZING FOR FINANCIAL CONTROL

Build Budget in Terms of Product

That brings us to the next point—how are these plans to be expressed for financial control purposes? The important thing to remember is that these plans must deal with physical things—men, material, machinery and products—and the use of financial figures is necessary only to express them in a common language so as to be able to relate apples and pears. In forecasting income, for example, it is not enough to express the future estimated sales simply as a percentage increase of dollar values each year. It is necessary to forecast the sales in terms of quantities of products, or at least classes of products, and then to turn these into dollar values. Otherwise it is not possible to forecast with any reasonable accuracy the related expenditures in labour, material and services, nor to foresee any re-arrangement of facilities which may be necessary, such as the provision of further plant and equipment.

Similarly, in budgeting for the usual revenue expenditures, it is not enough to use trends of the relative dollar amounts. For example, labour and material must be budgeted for on the basis of the forecasted quantities of products, because their extent will vary according to the type of product. Hence we should record this important principle:—in establishing budgets for all items of expenditure, they must represent the actual physical conditions which will obtain if the forecasted sales are to be achieved. This means that the actual physical conditions must be forecast before the dollar calculation can be made. It is in fact necessary to obtain answers to this kind of question “Knowing the production rates of each product or type of product necessary for the sales plan, how many foremen and charge hands will be required in each future period? What will be the equivalent power consumption? How will the sales organization need to be changed to meet the plans? What new machinery is required?” Having obtained the answers you can then set dollar budgets for supervision, for power consumption, for sales salaries and commissions, for provision for plant capital expenditures and so on. Establish the future physical conditions first, and then turn them into dollar budgets.

I appreciate, of course, that it will not always be possible to do this. But if you try to follow this principle as faithfully as possible you will be surprised how often you can obtain a reasonably accurate physical basis for your budget, instead of a monetary guess.

Responsibility for Setting Budget

My third point concerns responsibility for setting the budgets. With whom should this lie? The answer is supplied by the arguments of the previous point. If budgets are to be based on physical conditions, then responsibility for forecasting the basic data must rest with the man who is responsible for setting up the conditions. In other

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words, the plant manager must be responsible for saying "I will require so many men, foremen and chargehands in such-and-such a period. I shall be purchasing this machine and that piece of equipment" and so on. The sales manager must be responsible for assessing the sales plan and the number of salesmen—and similarly all through the organization, the appropriate manager must be the man to say what he needs to carry out his part of the plan—his must be the responsibility for forecasting the physical conditions. The responsibility for turning these conditions into dollar budgets and tying them into a complete financial picture clearly lies with the function best fitted for the job—that is, the accounting function. There is, of course, another strong argument for placing the responsibility for establishing the basic physical data with the plant manager. The constant objective of all concerned in the enterprise must be to reduce operating costs to the minimum attainable. This can only mean appropriate changes in the physical conditions—the manufacturing methods, selling methods, changes in materials used and so on. And the man who can make these changes is, of course, the line manager. The need should be constantly in his mind and in making his forecasts he should take into account any potential improvements which he knows will be in operation in the future.

Responsibility for Following Budget

My fourth point can be said to boomerang from the previous discussion. It concerns the localization of responsibility for seeing that the plans are carried out. Now if the manager of a certain area of activity, e.g. a plant manager, is responsible for establishing the physical conditions in that area—men, material, plant and services—he is not only the man to hold responsible for saying what these are *going* to be in order to achieve the required production plans; he is also the man to hold responsible when these physical conditions do not in practice turn out to be what he said they were going to be. He is the man, in other words, who must answer for any serious deviation from the dollar budgets. It is important therefore that the control accounts throughout the enterprise be set up in such a way that items for which an individual can be held responsible are isolated for presentation to that individual. Looked at in another way, the organization and the presentation of the financial control accounts must correspond with the organization structure of the enterprise.

Keep Tabs on Organization and Methods

My fifth point has to do with that ceaseless seeking for minimum costs to which I referred earlier. It involves constant methods study in its broadest sense throughout the enterprise, as well as periodic examination of the organization structure. This work is carried out in every progressive company; by whom it is carried out need not be discussed at this juncture, and all we want to do here is to recognize the

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importance of the function as an essential part of cost control. But it clearly affects the preparation of budgets, and so we have a further job for the budget preparation personnel—to keep in touch with progress made in cost reduction studies and to assist those concerned by indicating suitable items for examination as far as this is possible. For example, a likely avenue for investigation might be indicated by this kind of comment from the budget personnel: “A lot of money has to be budgeted for to cover labourers—couldn’t something be done to cut down material handling?”

Guide Posts for Financial Control

Having discussed these five points, we can now turn to the question of organizing for financial control itself. We have already set up these guide posts:—

1. In order to control it is necessary to forecast for as long a period ahead as possible, both the total income and the total expenditure in the form of labour, material and other expenditure at the plant level; selling, administrative and other costs in the rest of the enterprise; research and development expenditure; taxes; dividends and other forms of interest on monies borrowed for capital expenditure on plant, machinery and other items of a capital nature.
2. These forecasted income and expenditure items must be derived from a study of the future physical conditions within and without the enterprise which the sales plans will make necessary.
3. Responsibility for forecasting the future physical conditions must rest with the individual whose job it is to set up these physical conditions; responsibility for turning these into dollar budgets is logically placed on the accounting function, which can provide the necessary co-relation.
4. Responsibility for keeping to the budgets lies with the individual line manager concerned with the budget items. The budgetary control accounts must therefore enable each individual responsible for an area of income or expenditure to see how he has performed against budget.
5. Budget preparation personnel have a strong interest in the work being carried out to improve organization and methods, both from the angle of keeping abreast of progress and in order to give guidance as to potential areas.

The Two Functions of Control Accounting

The first conclusion is that the organization has to provide for a job which is to be performed by men with accounting training, but which is quite different to the usual routine accounting. It should in fact be considered a separate function. The accounting department, as far as *control* is concerned, has therefore to perform these two separate functions:

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- (a) preparation of the budgets on the basis of the forecasted physical conditions according to information supplied
- (b) Accounting of the actual income and expenditure so as to show performance against budgets.

Both are facets of that part of the control function carried out by accounting personnel; they can be identified as "budget preparation" and "control accounting".

The relation between these two functions and the operating or line functions has already been discussed in the case of the budget preparation; i.e. we have already established that the accounting personnel has to rely on the forecast of the physical conditions by the appropriate line manager to provide the basis for the budgets. The other relationship, that between the control accounting function and the operating or line functions, must take this viewpoint into consideration.

The control accounting personnel is concerned with the presentation of the figures showing actual performance against budget. The important aspect is then to determine why the actual performance is better or worse than was forecasted, and in order to find out there is quite an amount of interpretation of figures to do. It seems logical, therefore, that the budget preparation personnel should carry out this examination with the line manager concerned, because he (the budget preparation personnel) knows how the individual budgets were prepared.

In practice the budget man will work closely with the control accounting man in order to know what went into the "actual" figures before presenting them to the line manager for discussion. And often the two jobs will be carried out by the same man.

Role of the Control Accountant

The next conclusion to be drawn is that both these functions—budget preparation and control accounting—are necessary to assist the line manager to carry out his responsibility in the control field, i.e. to make adequate plans for achieving his part of the enterprise's objective and to ensure that these plans are carried out as closely as circumstances will permit. The relevant accounting personnel is therefore in the position of an assistant to the line manager; in no sense must he act in a "police" capacity—he is *not* a controller of the line manager's actions; he is *not* a snooper. The necessary disciplinary action where this is required relative to any serious deviation from budget must be taken by the line manager's superior. At the same time the accounting personnel has a duty to perform arising from his *functional* responsibility as an accountant; he must see to it that all the relevant facts are exposed and not glossed over by the line manager. Primarily, however, what arises from all this is that the accounting personnel, particularly the budget preparation personnel, are there to help the line manager.

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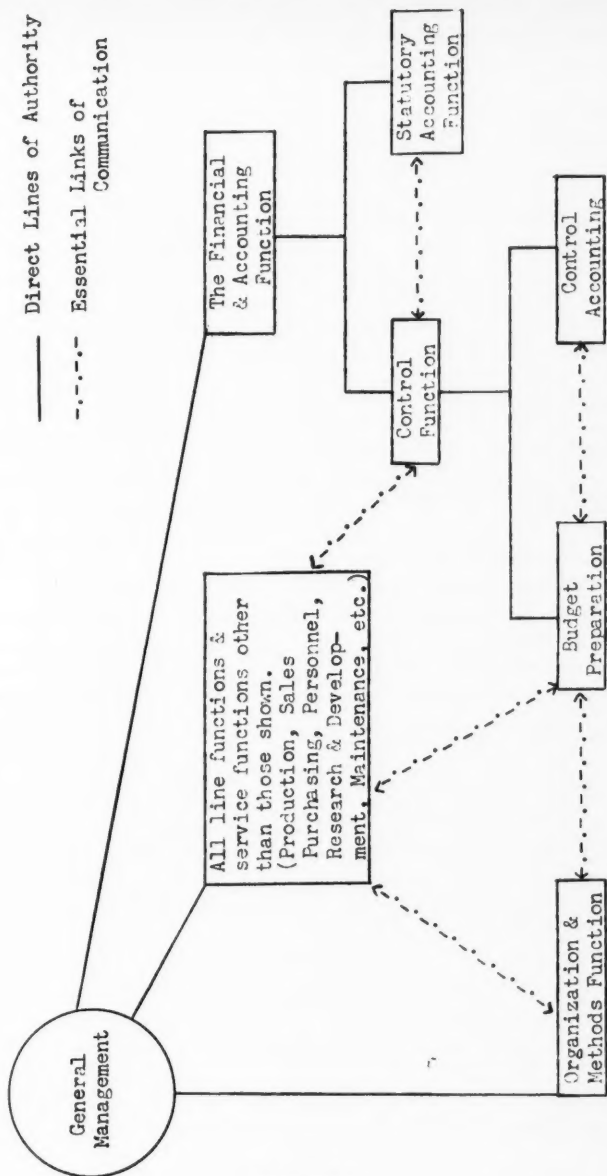


EXHIBIT I

COST AND MANAGEMENT

Organizational Relationships

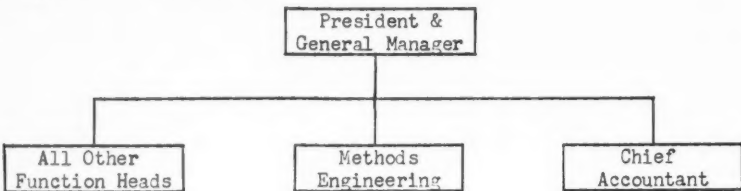
I want now to deal with the actual organization aspect in two parts. First I want to show the organizational relationships in diagrammatic form; secondly I shall illustrate various ways of satisfying the requirements of these relationships by showing typical examples of organization to suit different conditions.

First, then, the diagram shown in Exhibit I. This illustrates the points already made in the paper. Note that statutory accounting, that is, the preparation of annual accounts, is shown as a separate function to that of control. Control accounts must of course be tied into the statutory accounts, but there is an important difference between the two types of accounts. Statutory accounts must be accurate; they are in fact subject to audit to ensure that; they are often drawn up in the form which will best tell the overall story to the public and the shareholders. On the other hand, control accounts have as their purpose assisting management to run the enterprise successfully; because their main purpose is to show managers whether they are keeping to the plans made, accuracy is of a far less importance than time. It is no use working out the ship's position to three decimal places and then telling the captain that at 10 p.m. the previous night he was within two hours sailing of hitting a reef. By then he knows it, and nothing can be done about it. In control accounting speed, not accuracy, is the determining factor; in statutory accounting it is accuracy, not speed.

Note too, the double relationship between the line functions and the control function. The line manager will be supplied with control accounts as part of the routine procedure, but in detailed consideration of these he should call in the man responsible for budget preparation.

Applications of Control Organization

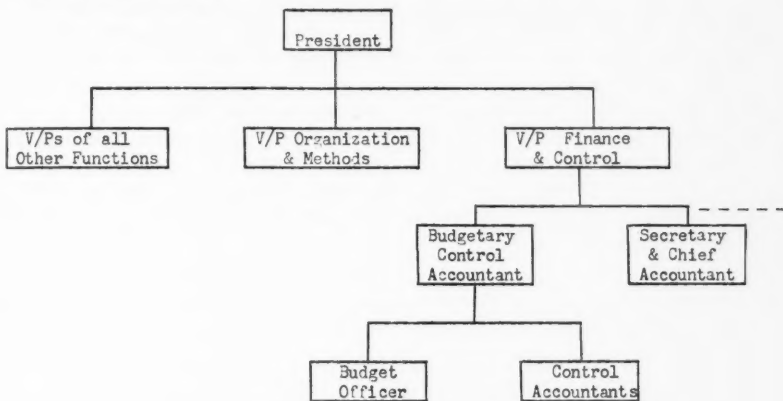
Now for some illustrations as to how these relationship requirements can be achieved. Exhibit 2A shows a possible application to a small manufacturing company. The chief accountant wears both the budget preparation and control accounting hats, although he may have further staff for the latter function. Organization is carried out by the President, and methods could be the responsibility of a Methods Engineer—or Production Engineer.



**Small Enterprise
EXHIBIT IIA**

ORGANIZING FOR FINANCIAL CONTROL

Exhibit 2B shows a larger manufacturing unit, but still under one roof. Here the Vice-President Finance has to undertake a greater measure of responsibility relative to financing rather than control; he delegates the latter to a Budgetary Control Accountant, leaving the statutory accounting in the hands of the Company Secretary as chief accountant. The Budgetary Control Accountant will have a budget officer to assist him in budget preparation and an appropriate staff for control accounting.



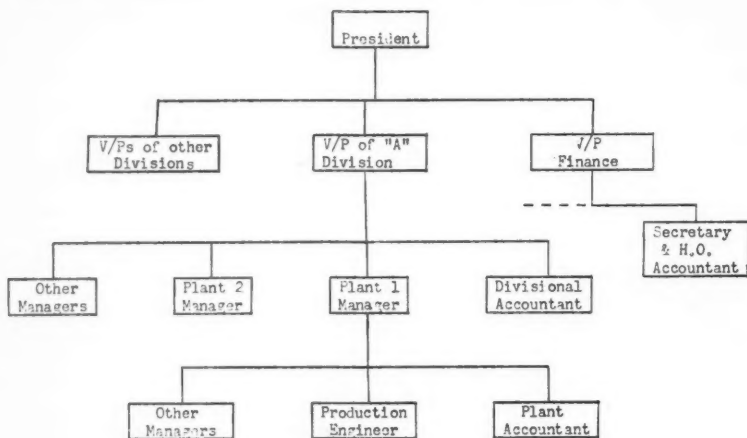
Large Enterprise in Single Unit

EXHIBIT IIB

Exhibit 2C covers the enterprise with scattered units. Here the statutory accounting is carried out at headquarters only under the Vice-President Finance. Each of the Divisional Vice-Presidents should have a divisional accountant to assist him; generally this divisional accountant will carry out the budget preparation work for the division, because it will amount to collating the unit budgets. He will also collate the unit control accounts and submit them as a divisional control account. Similarly, the plant accountant is responsible for both aspects, but he may have a budget officer for the preparation of budgets as well as the appropriate control accounting staff. Note that in this kind of set-up the budgetary control personnel do not form part of the accounting *direct* organization, but are in the line organization. They are line specialists. But they are subject to *functional* control from the top downwards. The Headquarter personnel is in *staff* relationship to the line organization parallel to it, and the divisional organization is equally so. This relationship between the staff and line functions is important. No man should be called upon to serve two masters—it is the negation of the principle of centralization of authority—and the executive in charge of the line unit must have authority over all the

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members of his unit, including all specialists. The relationship, therefore, between headquarter and line unit specialists must always be of an advisory nature. As regards responsibilities this relationship can best be described as follows:—the specialist headquarter personnel is responsible for establishing the correct procedures and methods relative to the performance of the specialist function; the line unit manager is responsible for seeing that these procedures and methods are adopted in the specialist section of his unit; he then makes the specialist headquarter representative responsible for the proper explanation and instruction to his specialist staff. The authorities correspond closely. The headquarter specialist has the authority to tell the unit manager exactly what are the correct procedures in the specialist function; the unit manager has the authority to require his specialist section to do something about it; he delegates the authority for detailed instruction to the headquarters specialist. Summing all this up, the headquarter specialist says "It should be done this way," the unit manager says "Do it this way," and the headquarter specialist then instructs as to what "this way" means.



Multiple Unit, Large Enterprise

EXHIBIT IIC

Summary

I think I can best summarize what has been said to this point as follows:—

1. The primary purpose of financial control is to ensure that the short term and long term plans made for the enterprise are in fact achieved.

ORGANIZING FOR FINANCIAL CONTROL

2. The plans must be such that total income can be sufficient to meet total expenditure. And total expenditure includes not only the short term expenses relating to material, labour, overheads, administrative and selling costs, but also dividends, interest, and the financing of the long term plans.
3. The short term plans relate to physical conditions. They are converted into dollar budgets by a budget preparation section of the accounting function; the dollar budgets are used for control purposes by comparing them periodically with actual figures of income and expenditure, this job being the control accounting section of the accounting function.
4. An essential part of cost control is achievement of minimum costs by improving the physical conditions. This makes necessary an organization and methods study function to be catered for in the organization.
5. Line managers determine the physical conditions. They rely upon the budgetary control personnel to help them achieve proper performance against plans, and upon the organization and methods personnel to help them achieve minimum costs.
6. Hence organizing for financial control must provide for adequate information to line managers to enable them to carry out their responsibilities; it must therefore provide for the functions of budget preparation, control accounting and organization and methods study at levels determined by the line structure. By whom these functions are carried out is dependent upon the load in man-hours represented by each of the functions, upon the organization of the line functions, and upon geographical conditions.

This is a big subject and I have been able to do no more than scratch the surface. But I hope I have given you sufficient to appreciate the main principles which should guide you in organizing for financial control.

FOR FURTHER READING

- PLANNING ORGANIZATION FOR COST CONTROL, by William H. Hopkins, Cost and Management, June 1957.
- ORGANIZATION FOR LONG RANGE PLANNING, by H. E. Wrapp, Harvard Business Review, Jan.-Feb. 1957.
- FINANCIAL ORGANIZATION, by Leslie G. J. Wong, Cost and Management, April 1956.

A New Look at Production Planning . . .

By J. N. REYNOLDS, JR.

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In solving production planning problems in this job-shop plant, three vital questions were uppermost: What is in process? When is it going to be completed? When should orders for new requirements be entered into process? The following is a description of how mechanical accounting equipment methods were used to develop and maintain this information.

THE Graystone Machine Company manufactures 45 different models of machinery including milling machines, various types of grinders and automotive repair equipment. Most of the items produced are, in part, custom-assembled to meet given customer specifications.

The plant is operated basically on a "job-shop" system and is laid out functionally by departments.

Parts are manufactured in small lot quantities and upon completion are delivered to stock. Parts required for assembly are picked out of stock and delivered to an assembly area.

Planning Problems

The production planning problems involved in this type of operation are many and complex. Most of these problems however could be resolved quite readily if a way could be found to develop and maintain current information relative to:

1. What is in process?
2. When is it going to be completed?

Considering the complexity of the information desired and the speed and accuracy with which it had to be developed and maintained, mechanical accounting equipment was selected to do the job.

3. When should orders for new requirements be entered into process?

Master Operation Cards

The first step was to produce what is called master operation cards for all manufactured parts. This was accomplished by key punching an I.B.M. card for every operation performed on every part. These master operation cards were punched to include the following information:

1. Part number
2. Operation number
3. Department number
4. Planning group
5. Set-up hours
6. Unit run time hours

(See Exhibit I)

A NEW LOOK AT PRODUCTION PLANNING

Requisitions to manufacture are received by the tabulating department from the inventory control department. These requisitions designate the quantity to be manufactured, the order number, and the date the items are scheduled to arrive in stock.

0140000734	1700310177				TIME	
0140000734	1600106144				TIME	
0140000734	1500150034				TIME	
0140000734	1400216086				TIME	
0140000734	13A0235129				TIME	
0140000734	1300230119				TIME	
0140000734	12B0106144				TIME	
0140000734	12A0340133				TIME	
0140000734	120015B036				TIME	
0140000734	110009A027				TIME	
0140000734	10A0106144				TIME	
0140000734	1000150034				TIME	
0140000734	0900190052				TIME	
0140000734	08A0150034				TIME	
0140000734	080007B023				TIME	
0140000734	0700340133				TIME	
0140000734	06A015B036				TIME	
0140000734	0600090026				TIME	
0140000734	0500150034				TIME	
0140000734	0400300095				TIME	
0140000734	0300210078				TIME	
0140000734	02B0106144				TIME	
0140000734	02A0340133				TIME	
0140000734	0200200064				TIME	
0140000734	0100200061				TIME	

MAJOR UNIT	PART NO.	OPER. NO.	DEPT. NO.	PL. GROUP	SET UP TIME	RUNNING TIME	X DATE	LOAD QUAN	ORDER NO.	CLOCK NO.	CLOCK IN	SHIFT	PIECES	LOAD FACT
00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222
33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333
44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444
55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555
66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666
77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888
99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999

Master Operation Cards

EXHIBIT I

Header Cards

1. Part number
2. Part name
3. Quantity ordered
4. Order number

The header cards are then matched with their corresponding master operation cards for the purpose of creating operation load cards.

[illegible]

EXHIBIT II

The operation load cards are produced by duplicating the master operation cards and at the same time gang punching into each operation card the quantity and order number from the corresponding header card.

(See Exhibit III)

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A NEW LOOK AT PRODUCTION PLANNING

The calculation of these scheduled operation dates includes time allowances for performing the actual operation, plus time to move, plan, wash and inspect.

0140000734	1700	310	177	018		TIME	6916
0140000734	1600	106	144	018	X	TIME	6916
0140000734	1500	150	034	018	X	TIME	6916
0140000734	1400	210	086	018	X	TIME	6916
0140000734	13A0	235	129	018	X	TIME	6916
0140000734	1300	230	119	018	X	TIME	6916
0140000734	12B0	106	144	018	X	TIME	6916
0140000734	12A0	340	133	018	X	TIME	6916
0140000734	1200	15B	036	018	X	TIME	6916
0140000734	1100	09A	027	018	X	TIME	6916
0140000734	10A0	106	144	018	X	TIME	6916
0140000734	1000	150	034	018	X	TIME	6916
0140000734	0900	190	052	018	X	TIME	6916
0140000734	08A0	150	034	018	X	TIME	6916
0140000734	0800	07B	023	018	X	TIME	6916
0140000734	0700	340	133	018	X	TIME	6916
0140000734	06A0	15B	036	018	X	TIME	6916
0140000734	0600	090	026	018	X	TIME	6916
0140000734	0500	150	034	018	X	TIME	6916
0140000734	0400	300	095	018	X	TIME	6916
0140000734	0300	210	078	018	X	TIME	6916
0140000734	02B0	106	144	018	X	TIME	6916
0140000734	02A0	340	133	018	X	TIME	6916
0140000734	0200	200	064	018	X	TIME	6916
0140000734	0100	200	061	018	X	TIME	6916

MAJOR UNIT	PART NO.	OPER. NO.	DEPT. NO.	PL. GROUP	11 UP	RUNNING TIME	DATE	LOAD QUAN.	ORDER NO.	TIME
10000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000	00000000
11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111	11111111
22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222	22222222
33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333	33333333
44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444	44444444
55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555	55555555
66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666	66666666
77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777	77777777
88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888	88888888
99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999	99999999

Operation Load Cards
EXHIBIT III

COST AND MANAGEMENT

At this point an I.B.M. card for each operation for every part that is to be entered into process has been developed to include the following information:

1. Part number
2. Operation number
3. Department number
4. Planning group
5. Set-up time
6. Unit run time
7. Scheduled operation date
8. Order quantity
9. Order number
10. Set-up load hours
11. Total load hours

(See Exhibit IV)

The operation load cards are filed in an unreleased order file by date of first operation and, five days prior to date of first operation the cards are removed from the unreleased file and duplicated. One set is placed in an active load file and the second set travels with the order through the process operations.

The set of cards traveling with the order through process serves a dual purpose. First, they supply the necessary information to manufacturing personnel for the purpose of assigning work to machines in accordance with the schedule. Second, as each operation is completed, they are forwarded to the work-in-process control section and serve as the medium for deleting the active load file of operations completed.

In this manner, an active load file has been developed and maintained which contains an I.B.M. card for every unperformed operation on every part in process, showing where each job is to be done, when it is scheduled to be done, and how many hours are necessary to perform each operation.

Vital Reports

With this information it is now possible to produce all the necessary facts relative to the first question, "What is in process?"

From a mechanical analysis of this file the following reports are produced: 1. A "Machine Load" report showing the orders ahead of each planning group, their scheduled date, and the total scheduled load hours for each week by planning group. 2. A "Daily Production" report showing the orders completed by each planning group, the total hours produced, and the schedule date when they should have been produced. 3. "Assembly Status" reports showing each part wanted for any given assembly, the uncompleted operations thereon and the number of process hours still to be performed. 4. Reports for special study

A NEW LOOK AT PRODUCTION PLANNING

0140000734	1700	310177	018	X300	TIME OUT	6916
0140000734	1600	106144	018	X298	TIME OUT	6916
0140000734	1500	150034	018	X295	TIME OUT	6916
0140000734	1400	216086	018	X292	TIME OUT	6916
0140000734	1300	235129	018	X289	TIME OUT	6916
0140000734	1200	230119	018	X287	TIME OUT	6916
0140000734	1100	106144	018	X284	TIME OUT	6916
0140000734	1000	340133	018	X282	TIME OUT	6916
0140000734	0900	158036	018	X280	TIME OUT	6916
0140000734	0800	09A027	018	X277	TIME OUT	6916
0140000734	0700	106144	018	X275	TIME OUT	6916
0140000734	0600	150034	018	X272	TIME OUT	6916
0140000734	0500	190052	018	X270	TIME OUT	6916
0140000734	0400	08A0150034	018	X268	TIME OUT	6916
0140000734	0300	0800078023	018	X265	TIME OUT	6916
0140000734	0200	340133	018	X263	TIME OUT	6916
0140000734	0100	158036	018	X260	TIME OUT	6916
0140000734	0000	090026	018	X254	TIME OUT	6916
0140000734	2300	150034	018	X252	TIME OUT	6916
0140000734	2200	300095	018	X248	TIME OUT	6916
0140000734	2100	210078	018	X246	TIME OUT	6916
0140000734	2000	106144	018	X244	TIME OUT	6916
0140000734	1900	340133	018	X241	TIME OUT	6916
0140000734	1800	200064	018	X239	TIME OUT	6916
0140000734	1700	200061	018	X236	TIME OUT	6916

ORDER NUMBER	DATE NUMBER	DEPT	ALIAS	STANDARD	TIME IN	TIME OUT
MAJOR UNIT	PART NO	OPEN NO	DEPT NO	PL GROUP	SET UP TIME	RUNNING TIME
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100	1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

Operation Load Cards

EXHIBIT IV

COST AND MANAGEMENT

such as department overloads for sub-contract consideration and shift in man power requirements due to rescheduling.

The information made available from the active load file also serves as a basis for obtaining the facts relative to the second question, "When is it going to be completed?"

In a job machine shop system of production, it is necessary to be able to measure actual conditions. It is not enough to know only the conditions portrayed by a schedule. The changing effects on load and capacity due to failure to produce on schedule must be measured.

A "Where is it?" report has been developed to furnish this vital information. This report is developed by reproducing the active load cards and processing them by the I.B.M. 604 calculator in the following manner:

- (1) The machine recognizes the first unperformed load card for each part and "picks up" the planning group number punched therein and stores this information.

- (2) The machine then compares the current date with the scheduled date on the card and computes and stores the number of days late, if any.

- (3) As each operation card for that part passes through the machine, the planning group retained in step (1) is punched into the card. The machine also adds the days late retained from step (2) to the scheduled date and punches the new date in each card.

From a mechanical analysis of these cards, it is then possible to summarize the load to show:

- (1) The orders currently at any given planning group, the hours required to complete them and the scheduled date on which they should have been completed as well as the number of days they are currently behind schedule.

- (2) The orders that will arrive at a given planning group in accordance with the rescheduled date if they move through process in accordance with their normal flow time. In other words, the load is adjusted to reflect any existing condition of tardiness. The report also shows where each order scheduled to arrive at any planning group is presently located.

An analysis of this adjusted load also shows where capacity and load are out of balance and must be adjusted to meet current conditions.

The load position as shown on the "Where is it?" report is the basis for answering the third question "When should orders for new requirements be entered into process?"

By taking all the given parts for each model and processing them in standard lot quantities in the same manner in which the machine

A NEW LOOK AT PRODUCTION PLANNING

load cards were produced standard load patterns for each model were developed. These patterns show the number of hours required by each planning group, by weeks, for a given stock wanted date. By fitting these patterns to the load hours as shown on the "Where is it report?" the effect of, and the requirements for, future releases are readily measured.

Conclusion

As a result of this system work in process is under control. This control has resulted in reduced inventories and improved flow of production, the end result of which is lower costs and better deliveries to customers.

There are still many other studies and reports that can be developed from the data made available by this system. During this past year the Graystone Company has utilized these data to eliminate the costly operation of taking a physical inventory. The year end inventory was calculated by mechanically summarizing the open order file.

These data have also been utilized to create engineering lists on I.B.M. cards. By synthesizing the engineering lists, reports have been developed that have aided the purchasing department and stock room in the performance of their functions and the engineering department in developing a parts standardization programme.

FOR FURTHER READING

STREAMLINED INVENTORY CONTROL AND STABILIZED PRODUCTION PLANNING, By Herbert J. Richmond, The Controller, April 1956.

ACCOUNTING: A TOOL FOR PRODUCTION PLANNING, By Gerald F. Rossettie, Cost and Management, November 1955.

DAILY BALANCING OF LABOUR LOAD, By R. W. Kindley, N.A.C.A. Bulletin, November 1955.

The Economics of Management Revisited . . .

By WILLIAM LAZER,
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Michigan State University,
Lansing, Mich.

In the June issue of Cost and Management appeared an article entitled "The Economics of Management" by Calvin C. Potter. The present author offers below his comments on certain portions of that article.

IN HIS recent article, Professor Potter presents an interesting manuscript dealing with "how economic ideas such as competition, demand and costs can mould or govern management's most important activity—innovation." The ideas are presented concisely, but the approach does not permit an adequate and unambiguous understanding of several of the ideas discussed. In particular I would like to append notes to three of the specific concepts referred to in the paper: the scope and stages of a product cycle, the role of costs and accounting records, and the description of operations research and linear programming as "advanced economic concepts."

Scope and Stages of a Product Cycle

Professor Potter explains that in tracing a product through its life cycle "in the initial stages, the producer of an absolutely new product enjoys a monopoly: his is a specialty good. How long it remains so before deteriorating into a common commodity depends upon a number of factors," and the factors listed are the firm's marketing policy, effectiveness of patents, secrecy of its processes, and capital costs of setting up. The point is that whether or not a good is a specialty good¹ is not determined by the monopoly position of the supplier, or by the newness of the product. Rather, it is determined by the buying habits of the consumer. For example, if buying habits of consumers are such that a new product is purchased with a minimum amount of effort at a convenient and accessible store, then the product from the stage of original presentation to the market is a convenience good. Hence, some goods may always be convenience goods, others may always remain specialty goods rather than follow the suggested cycle. Clearly then, the length of time a good will remain a specialty good before "deteriorating into an ordinary common commodity" (convenience or shopping good?) does not depend so much upon the factors presented but is more directly associated with the buying habits of purchasers. Moreover, it may well be that the transition of a good from a specialty to a convenience item is not a process of "deterioration" but may actu-

¹Since Professor Potter has not defined a "specialty good" to have a particular or unusual meaning in his usage of the term, it can only be assumed that he is referring to the commonly used marketing term which connotes goods for which the consumer is willing to make a special purchasing effort, or which have a particular attraction so that the consumer will go out of his way to purchase them. See for example, Maynard, H. H. and Beckman, T. N., *Principles of Marketing*, 5th edition, The Ronald Press Company, N.Y. 1952, p. 34 or Phillips, C. F. and Duncan, D. J., *Marketing Principles and Methods*, 3rd edition, Richard D. Irwin Inc., Homewood, Illinois, 1956, p. 96.

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ally lead to a broadening of market acceptance, a reduction in selling time and selling costs and conceivably an improved profit position for the firm.

Role of Costs and Accounting Records

The point that cost is a paramount consideration in product innovation and that management must have a clear understanding of the behaviour of costs is well taken. The suggestion that "to supply this kind of information—information of a kind to furnish a sound basis for managerial decisions—the financial accounts must be custom tailored . . . the accounts must be reformulated," is only a partial solution to the problem. This recasting of information, while it is an improvement over merely using information derived from conventional or historical accounting records leaves much to be desired. It does not provide the factual bases upon which the important effects of the promotional efforts of a firm on sales, and hence sales on costs and costs on profits can be determined. A better solution might be to bolster available accounting information, before making important decisions, by gathering and analyzing marketing research data. Such information when combined with reformulated accounting data will provide management with a sounder basis for decisions. In product innovation it is not the mere reclassification of present accounting information, but rather the determination of sales-cost-profit relationships through a knowledge of the interaction of marketing factors that is most basic to sound decisions. It is more than likely that conventional accounting records do not contain much of the pertinent information needed.

Advanced Economic Concepts?

In reference to the relationship between management and economics, operations research and linear programming are presented as "advanced economic concepts." While the definition of economics may be stretched and pulled to embrace untold activities which refer to alternative choices, it is doubtful whether operations research and linear programming per se should glibly be labeled as totally economic concepts. It might be more appropriate and accurate to refer to them as mathematical, philosophic or quantitative concepts. Rather than operations research and linear programming being advanced economic concepts, advanced economics uses operations research and linear programming techniques to solve economic problems. This relationship is clearly brought out by the following definitions:

"Operations research is the study of complex business, military, or government operations, where operations are considered as a whole . . . the total operation is studied by the methods of thought, experimentation and analysis . . . to support this method of thought and analysis a number of analytical techniques are available . . . the techniques range

2Wagee, John F., "Application of Operations Research to Marketing and Related Management Problems," *Journal of Marketing*, Vol. XVIII, Number 4, April 1954, pps. 361, 368, and 369.

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from symbolic logic to simple arithmetic, including the mathematical methods of analysis developed in probability theory in the field of statistical analysis.²

"Because OR has emerged out of other sciences it borrows from them quite heavily . . . The rapid growth of OR under its own name testifies to an increasing recognition of its uniqueness. But the differentiation is far from complete. The overlap of methods, techniques, and tools between OR and other fields is largely due to the way in which OR was initially and is still carried on. It is research performed by teams of scientists whose individual members have been drawn from different scientific and engineering disciplines. One might find, for example, a mathematician, physicist, psychologist, and economist working together on a problem of optimizing capital expansion. The effectiveness of such interdisciplinary teams in tackling the type of problem characterized as the subject matter of OR is not accidental."³

"Linear programming is defined as the process of determining a programme of activity by finding the optimum solution of a group of restrictive linear equation. Linear programming may be described as a mathematical technique for determining the most effective, desirable, or profitable course of action to take when the situation is governed by many known variables and conditions."⁴

³As quoted from Churchman, Ackoff, Arnoff, *Introduction to Operations Research* in "Operations Research In Industry", Crane, Roger R., *The Controller*, March 1957, p. 121.

⁴Greenwald, Dakota Ulrich, *Linear Programming*, The Ronald Press Company, New York, 1957, pps. 3 and 4.

NOTE: Since space is short, let me state briefly where I agree with Professor Lazer.

I agree that it may be advantageous if the historical costs can be reformulated on the basis of current market research data. But even if this is not practicable for cost or other reasons, the accounts should still be reformulated on the basis of estimates.

I further agree that, if I had said that operations research was an "advanced economic concept", I would have been distorting the concept. What I did say, however, was that "a positive example of welcome to economic ideas is 'Operations Research' . . . a method whereby managers solve complex problems by the use of advanced economic concepts such as linear programming and games theory." Note I did **not** say OR was an economic concept; I said economic concepts were used . . . and after reading some of the literature, I'm willing to argue that its solid core is economic.

Concerning his comments on the product cycle, I totally disagree. Accepting Professor Lazer's definition of a specialty good, it is apparent that such goods are a special instance of shopping goods wherein the buyer has so strong a preference for a particular brand that he is unwilling to accept other brands designed to do the same job. In other words, the substitutability of other brands is very low, which is a standard method of defining monopoly. It is because of this monopoly position, the lack of competitive substitutes, that the specialty good (which is usually premium priced) can fit the buying motives (the buying habits would determine such things as the location of agencies, the design and size of package, etc.) of the customers . . . the desire for distinction, exclusiveness, or some similar subjective motive. Inaccessibility to the masses in terms of either price or location is a necessary condition for catering to such buying motives.

Calvin C. Potter

An Ex-Engineer Looks at Cost and Management . . .

By A. JOHN LANGLEY

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In virtue of his engineering background and varied experience in development work, the author brings an unusual slant to business problems.

AN ENGINEER, or rather an ex-engineer, may be expected to know little about either cost or management. As far as the details are concerned, this is true enough. However, the old proverb "You sometimes can't see the forest for the trees" still holds good and those who are more deeply involved in the business "forest" may welcome a novel slant from an ex-engineer who has been able to view it without being too encumbered by the trees.

An engineer may be inclined to think of business organizations as "energy systems", like ships or aircraft, with their engines, crews and pay-loads. He knows that if the engines are inefficient, the ship may run at a loss; if the crew is unskillful, the ship may be wrecked.

The Ship

The criterion for the efficiency of the engines is the ratio of the amount of fuel used to the amount of useful work obtained from them. It takes constant vigilance on the part of the engineer to keep the engines going at maximum efficiency and to prevent the accumulation of small, apparently trivial, leaks of fuel which can seriously lower the operating efficiency of the engine. If you will think of your company as a ship and of money as fuel, I feel sure that you will appreciate the difficulties of keeping "fuel" leaks under control; also, like the well-meaning enthusiasts who insist on adding "frills" to a ship, some departments in your company may tend to add deadweight by adding unnecessary frills and thus increasing overhead.

The Crew

The other "energy system" of the organization is the "crew". People are, of course, the determining factor for success or failure, a point well emphasized in the May issue of *Cost and Management* by two excellent articles, "Cost Control is People" and "Welfare Plans." Now people are often contrary creatures full of mutually exclusive desires. We want wealth without toil, knowledge without study, prestige without merit, freedom without responsibility, and happiness without sacrifice. In addition, we have a general tendency to resist change and to sigh for the "good old days." Yet we hanker for the latest in gadgetry whilst resenting some change in our jobs which that very desire has caused. In sum, we are a mass of contradictions; we are people.

One result of our contrary nature can often be seen in our efforts to make ourselves richer, but later analysis frequently shows that all we have really done is to make ourselves poorer.

COST AND MANAGEMENT

For example, we may cite labour-management relations. Fifty years ago management in some companies tended to exploit labour, which resulted in slums, labour unrest, occasionally bloody riots, all ending in a decreased standard of living for one particular locality. Today, the pendulum has swung into reverse in some industries, and we find labour exploiting management to the point of forcing many companies out of business with consequent unemployment and poverty. Individually, in building up our own little empires within the company which add disastrously to overheads, many of us may be just short sighted, deluding ourselves that we are helping our individual purses, while all the time we may be making ourselves poorer in the long run.

The cure for this common tendency of self-impoverishment is of course education and training.

In this world "everything flows" as the Greeks said and anyone who imagines that he should aim for a safe job in a static world is sadly mistaken. No business is immune to change. The "crews" of your ship must be educated to this outlook, must understand the reason for it, and, if they wish to progress, should welcome it.

Pay Load

As for management, any which is incapable of masterfully administering the unforeseen cannot expect to survive for long. The eternal flow and throb of life continually confronts us with the unexpected. Our best laid plans go astray and our organizations must be sufficiently flexible to enable us to take advantage of the unforeseen situation.

The men who have the rare capability of creating *productive* jobs for others and raising the standard of living are amongst the king pins of our economy. Almost anyone can organize others, but not always productively.

The difference between those few and the rest of us who are concerned with the "producing" need not lead to loss of self-esteem, since the former will be the first to admit they could not operate without the skills of the others. All types are necessary, but each must recognize the necessity for the other, and all must cooperate understandingly if we wish our material welfare to increase.

There is clearly a continuing and important job of education to be done within all companies. There is cost control, but people must understand the reason for it; there is welfare, but people must appreciate that companies can fail as easily through too much of it as too little. There is the general understanding of the characteristics of the human and material "energy systems" comprising businesses, and of their organization for maximum efficiency.

When these things are regarded understandingly by management and employees, there is no reason at all why both cannot cooperate harmoniously, smooth out the rough spots, soften the tumbles, and make the world altogether a better place to live.

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